



March 8th, 2014

**Non-Chemical Piping Assessment Work Plan - Final
Absorbent Technologies Inc
140 Queen Avenue SW, Albany, Oregon**

NRC Environmental Services is pleased to present the following final Non-Chemical Piping Assessment Work Plan to open non-chemical piping and assist EPA in assessing piping for acrylonitrile or other potential hazards in residual pipe contents..

1. Background:

NRC understands that demolition of piping at the former Absorbent Technologies, Inc. (ATI) facility located at 140 Queen Avenue SW in Albany, Oregon has begun, but that acrylonitrile-contaminated free liquids have been encountered in piping formerly thought to contain only non-hazardous, non-regulated materials. On March 7th, 2014, opening of an "Industrial Water" line by demolition personnel resulted in a potential chemical exposure, and further demolition work has been halted on the site.

This Work Plan is intended to assist EPA and their contractor in the assessment of residual liquids or residue in the remaining piping inside of the manufacturing building at the above-referenced facility. NRC understands that measurements will be made of pH, volatile organic compounds (VOC) content and acrylonitrile content.

2. Non-Chemical Piping Assessment:

2.1. Work Plan

A variety of piping systems are present in the manufacturing portion of the former ATI facility, including piping labeled "City Water", "Industrial Water", "Steam Supply", "Steam Return", "Cooling Water", "Boiler Water", "Starch Slurry", "Co-Polymer" and others:

- a) Beginning in the southwest corner of the building interior, NRC personnel will identify one line at a time and follow the line through the structure, opening the line at intervals to be determined by EPA.
- b) Opening of piping will be accomplished where possible at existing flanges using mechanical tools. In some cases cutting tools will be needed to create openings in low areas to allow access to residual contents. A combustible gas indicator will be present when cutting tools are in use to ensure that no flammable or explosive atmospheres are encountered;
- c) Any free liquids encountered will be collected to the extent practical in drums, totes or other containers for further characterization. NRC personnel will assist in the labeling and marking of such containers for future reference;

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- d) NRC will assist EPA and their contractor in the obtaining of samples from residual piping contents, including as needed sediment, scale, residue, free liquids or other;
- e) NRC personnel will mark piping systems with a distinctive color of paint, marking tape or other durable marking that will identify the system as having been opened and assessed;

2.2. Safety Measures

a) Air Monitoring

NRC assumes that EPA or their contractor will be performing periodic ambient air monitoring in the vicinity of pipe opening activities using a flame ionization detector or acrylonitrile-specific colorimetric indicator tubes. In addition, NRC personnel will work to obtain their own supply of acrylonitrile-specific colorimetric indicator tubes in order to assume the duties of on-site industrial hygiene air monitoring prior to the implementation of any further work plans.

b) Action Levels

AIR MONITORING ACTION LEVELS		
Instrument: Colorimetric Indicator Tubes or FID	Reading	Action
Monitor ambient air in breathing zone of personnel engaged in disassembly or cutting of various piping systems	<2 PPM AN	• Safe for Level D PPE
	2-20 PPM AN	• Upgrade to Level C PPE
	>20 PPM AN	• Upgrade to Level B PPE
Instrument: Combustible Gas Indicator	Reading	Action
Monitor in work zone near any cutting operations that may produce an ignition source	<5 % of LEL	• Safe for normal operations
	5-10 % of LEL	• Increased risk of fire or explosion; discontinue operations until engineering controls are instituted to lower flammable vapor levels below 5% of LEL
	>10 % of LEL	• Discontinue operations and withdraw personnel to safe distance until vapors dissipate

- Level C PPE includes the below-referenced modified Level D PPE with the addition of a full-face air-purifying respirator with organic vapor/acid gas cartridges.
- Level B PPE includes the below-referenced modified Level D PPE with the addition of self-contained breathing apparatus or air-line supplied-air respirator with escape canister.

c) Personal Protective Equipment

Modified Level D or Level C Personal Protective Equipment (PPE) is proposed for use in the above-referenced pipe-opening and sampling activities, and includes the following at a minimum:

- Hard hat
- Saranex-coated Tyvek Coveralls
- Inner Nitrile gloves
- Outer PVC or butyl rubber gloves
- PVC steel-toed boots
- Face shield (or optional full-face air-purifying respirator – for face protection only, no cartridge specified)

Additional PPE proposed for occasional use during site activities includes fall protection equipment (harness and lanyard) when working above 6 feet in height, and ear plugs/muffs when ambient noise rises above 85 dB.

An MSDS for acrylonitrile is attached to this Work Plan as Appendix A. I appreciate the opportunity to provide you with this final Non-Chemical Piping Assessment Work Plan. If you have any questions regarding this document, you can reach me via e-mail at rransdell@nrcc.com, or by cell phone at 503-209-2209.

Sincerely,

Robert A. Ransdell

Robert A. Ransdell, Ph.D.

Project Manager

NRC Environmental Services

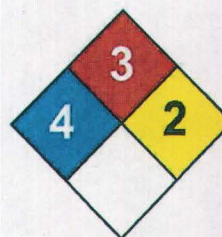
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Appendix A Acrylonitrile MSDS



Science Lab.com
Chemicals & Laboratory Equipment



Health	3
Fire	3
Reactivity	1
Personal Protection	H

Material Safety Data Sheet Acrylonitrile MSDS

Section 1: Chemical Product and Company Identification

Product Name: Acrylonitrile

Catalog Codes: SLA2566

CAS#: 107-13-1

RTECS: Not available.

TSCA: TSCA 8(b) inventory: Acrylonitrile

CI#: Not available.

Synonym: Vinyl Cyanide; Propenitrile

Chemical Name: Acrylonitrile

Chemical Formula: C₃H_{3.5}N

Contact Information:

Sciencelab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Acrylonitrile	1017-13-1	>99

Toxicological Data on Ingredients: Acrylonitrile: ORAL (LD50): Acute: 78 mg/kg [Rat]. 27 mg/kg [Mouse]. DERMAL (LD50): Acute: 63 mg/kg [Rabbit]. VAPOR (LC50): Acute: 333 ppm 4 hours [Rat]. >90 ppm 4 hours [Monkey].

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (permeator), of eye contact (irritant). Severe over-exposure can result in death.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. **MUTAGENIC EFFECTS:** Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. **TERATOGENIC EFFECTS:** Classified POSSIBLE for human. **DEVELOPMENTAL TOXICITY:** Classified Reproductive system/toxin/female, Reproductive system/toxin/male [POSSIBLE]. The substance may be toxic to blood, kidneys, liver, cardiovascular system, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband.

WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 481.11°C (898°F)

Flash Points: CLOSED CUP: -1.1111°C (30°F). OPEN CUP: 0°C (32°F).

Flammable Limits: LOWER: 3.1% UPPER: 17%

Products of Combustion: These products are carbon oxides (CO, CO₂).

Fire Hazards in Presence of Various Substances:

Highly flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials, of acids, of alkalis.

Fire Fighting Media and Instructions:

Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards:

In the presences of catalysts, or when the substance is confined, the polymerization rate may be accelerated leading to explosion. Acrylonitrile forms explosive mixtures with air based on its low flash point. It easily forms violently explosive polymerides when exposed to heat, light, strong bases, strong acids, strong oxidizers, azoisobutyronitrile, dibenzoyl peroxide, di-tert-butylperoxide, bromine or silver nitrate. Acrylonitrile may explosive reactions with benzyltrimethylammonium hydroxide + pyrrole. It may also have explosive reactions with tetrahydrocarbazole + benzyltrimethylammonium hydroxide.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:

Flammable liquid. Poisonous liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage:

Light Sensitive. Store in light-resistant containers. Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 2 (ppm) from ACGIH (TLV) [United States] TWA: 4.3 (mg/m3) TWA: 1 CEIL: 10 from NIOSH TWA: 2 STEL: 10 (ppm) from OSHA (PEL) [United States] TWA: 2 (ppm) [United Kingdom (UK)] TWA: 4.3 (mg/m3) [United Kingdom (UK)] TWA: 2 STEL: 4 (ppm) [Canada] TWA: 4.3 STEL: 8.6 (mg/m3) [Canada]³ Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: mild Peach kernels. (Slight.)

Taste: Not available.

Molecular Weight: 53.06 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 77.3°C (171.1°F)

Melting Point: -82°C (-115.6°F)

Critical Temperature: 262.78°C (505°F)

Specific Gravity: 0.806(Water = 1)

Vapor Pressure: 11.1 kPa (@ 20°C)

Vapor Density: 1.8 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 0.3

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:

Soluble in diethyl ether, acetone. Very slightly soluble in cold water, hot water. Soluble in all common organic substances and isopropyl alcohol. Soluble in benzene and alcohol

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability:

Heat, ignition sources, light, loss of inhibitor. Polymerization may occur, especially when exposed to visible light or in the absence of oxygen

Incompatibility with various substances:

Highly reactive with oxidizing agents, acids, alkalis. Reactive with metals.

Corrosivity: Highly corrosive in presence of aluminum, of copper.

Special Remarks on Reactivity:

Light Sensitive. Incompatible with strong oxidizers, strong acids (nitric acid, sulfuric acid, chlorosulfonic acid), strong bases (potassium hydroxide, sodium hydroxide), amines, 2-aminoethanol, bromine, ethylene diamine, oleum. Unless inhibited (usually with methylhydroquinone), this material may spontaneously polymerize, or it may spontaneously polymerization under certain conditions. Polymerization reactions are usually highly exothermic. Small amounts of acids (nitric or sulfuric) may neutralize the ammonia used to inhibit acrylonitrile and create uninhibited, unstable acrylonitrile. Strong bases will cause acrylonitrile to violently polymerize. It may spontaneously polymerize when heated, or exposed to light.

Special Remarks on Corrosivity: It attacks copper, copper alloys, and aluminum in high concentrations.

Polymerization: Yes.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 27 mg/kg [Mouse]. Acute dermal toxicity (LD50): 63 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): >90 4 hours [Monkey].

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [POSSIBLE]. May cause damage to the following organs: blood, kidneys, liver, cardiovascular system, central nervous system (CNS).

Other Toxic Effects on Humans:

Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects (fetotoxicity, maternal effects on fertility, paternal effects on fertility). May affect genetic material (mutagenic). May cause cancer (tumorigenic) based on animal data. It is a suspect human carcinogen. May cause birth defects (musculoskeletal, central nervous system, cardiovascular)

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes severe skin irritation. Prolonged skin contact may cause formation of large vesicles after a latent period of several hours. The burns resemble second degree thermal burns, but with little pain or inflammation. May be absorbed through skin. May be harmful if absorbed through skin. May affect behavior/central nervous system, respiration and gastrointestinal tract is absorbed through skin. Eyes: Causes moderate eye irritation. Lachrymator. Inhalation: May be harmful if inhaled. Inhalation of high concentrations may affect behavior/central nervous system with symptoms including central nervous system depression, seizures, weakness in the limbs, dizziness, impaired judgement, irritability, apprehension, weakness, lightheadedness, headache, anxiety, agitation, stupor, seizures, ataxia, confusion, coma. May also affect cardiovascular system (palpitations, arrhythmias, cardiac conduction defects, rapid heartbeat), respiration (hyperventilation, dyspnea), gastrointestinal system (nausea, vomiting). Inhalation may cause cyanosis (a bluish discoloration of the skin due to deficient oxygenation of the blood). Ingestion: Harmful if swallowed. Causes digestive tract irritation with nausea, and vomiting. May affect behavior/central nervous system, and respiration with symptoms similar to inhalation. **Chronic Potential Health Effects:** Repeated contact by inhalation or ingestion may affect the liver (jaundice), urinary system (kidneys), metabolism. Repeated contact by ingestion may also affect the blood (anemia).

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information**DOT Classification:**

CLASS 3: Flammable liquid. CLASS 6.1: Poisonous material.

Identification: : Acrylonitrile, inhibited UNNA: 1093 PG: I

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information**Federal and State Regulations:**

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Acrylonitrile California prop. 65:

This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Acrylonitrile Connecticut hazardous material survey.: Acrylonitrile Illinois toxic substances disclosure to employee act: Acrylonitrile Illinois chemical safety act: Acrylonitrile

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):

R11- Highly flammable. R16- Explosive when mixed with oxidizing substances. R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R36/38- Irritating to eyes and skin. R40- Possible risks of irreversible effects. R62- Possible risk of impaired fertility. R63- Possible risk of harm to the unborn child. S1/2- Keep locked up and out of the reach of children. S36/37- Wear suitable protective clothing and gloves. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 3

Reactivity: 1

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 4

Flammability: 3

Reactivity: 2

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 03:37 PM

Last Updated: 05/21/2013 12:00 PM

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Rich, Christopher W. (Perkins Coie)

From: Feldman, Stephen (Perkins Coie)
Sent: Friday, March 14, 2014 11:27 AM
To: Rich, Christopher W. (Perkins Coie)
Subject: FW: Draft Work Plan for Remaining ATI Site Activities
Attachments: image001.jpg; ATT00001.htm; ATI Queen Avenue Facility_Final Haz-Mat Removal and Abatement Work Plan_03-14-14.pdf; ATT00002.htm

From: Dave Ellis [DEllis@capacitycommercial.com]
Sent: Friday, March 14, 2014 11:13 AM
To: Feldman, Stephen (Perkins Coie)
Subject: Fwd: Draft Work Plan for Remaining ATI Site Activities

Hat do you think they are positioning to defend?

Sent from my iPhone
Dave Ellis

Begin forwarded message:

From: "Ransdell, Robert" <RRANSDELL@nrcc.com<<mailto:RRANSDELL@nrcc.com>>>
To: "'heister.dan@epa.gov<<mailto:heister.dan@epa.gov>>" <heister.dan@epa.gov<<mailto:heister.dan@epa.gov>>>
Cc: "Jonathan Sheckard" <jsheckard@rivercityusa.com<<mailto:jsheckard@rivercityusa.com>>>, "Dave Ellis" <DEllis@capacitycommercial.com<<mailto:DEllis@capacitycommercial.com>>>
Subject: Draft Work Plan for Remaining ATI Site Activities

Dan –

Here is a draft work plan for the remaining work that I am aware of on the ATI Queen Avenue project site. As far as I know, these items were not on any prior work plan and all of it is new work added since the initial tank cleaning phase finished in early January. Hopefully I have included everything we have talked about – let me know if I have left out any scope items.

Let me know if you have any comments or suggested changes. If this looks good, I will re-submit as a final plan and plan for re-mobilization. FYI, I have ordered the necessary air monitoring equipment to take over that duty from EnE, but I don't know if I will have it in place to start air monitoring on Monday. If you want us to mobilize on Monday, can you have EnE continue monitoring until I get my equipment and supplies delivered? Hopefully that won't be any later than Tuesday.

Thanks,

Bob Ransdell
Project Manager

NRC Environmental Services Inc.
Error! Hyperlink reference not valid.>> / rransdell@nrcc.com<<mailto:rransdell@nrcc.com>><<mailto:xxxxx@nrcc.com>>

[NRC_FINAL-PMS-CMYK-RGBcropped]

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March 14th, 2014

**Final Hazardous Materials Removal and Abatement Work Plan
Absorbent Technologies Inc
140 Queen Avenue SW, Albany, Oregon**

NRC Environmental Services is pleased to present the following draft Final Hazardous Materials Removal and Abatement Work Plan to complete the removal or abatement of residual hazards present in a number of systems on the Absorbent Technologies, Inc Queen Avenue project site, including the acrylonitrile tank/pump/vapor scrubber system, the Graft reactor, and the ceric ammonium nitrate tank/pump system.

1. Background:

NRC understands that previously-identified hazards associated with the chemical piping, co-polymer piping, starch slurry piping and other miscellaneous piping at the above-referenced ATI Queen Avenue site have now been assessed and/or abated (refer to the approved "Chemical Piping Re-Cleaning Work Plan, "Piping Demolition Work Plan", and "Non-Chemical Piping Assessment Work Plan").

This draft Final Hazardous Materials Removal and Abatement Work Plan is intended to address the remaining tanks, piping, pumps and carbon scrubbers on the property that have previously been identified as presenting a potential hazard based on their acrylonitrile contaminant levels or the potential for other residual products.

2. Acrylonitrile Vapor Scrubbing Carbon Filtration Units:

Three optional methods for removing acrylonitrile-contaminated activated carbon from the five carbon filtration vessels on site are presented here. A choice among these options will be made by EPA in conjunction with the property owners when additional information is available on the ignitability of spent carbon, the feasibility of management by carbon supplier Evoqua, the applicability of any EPA waste codes and the availability of a landfill disposal method through Waste Management. These options are listed in order of their desirability (i.e. Option 1 will likely be chosen if it is possible – if not, Option 2 will be chosen, defaulting to the next most desirable option only if the prior option is not available).

2.1. Option 1: Management by Carbon Supplier Evoqua

EPA, through their contractor EQM, has made contact with the supplier of activated carbon to the former ATI facility. NRC understands that there is a good likelihood that this material can be managed by the supplier, Evoqua, as a turn-key project. Little information has been made available at this time as to the details of carbon removal, but choice of this option is highest in desirability due to the management method (regeneration and re-use of spent carbon as opposed to landfill or incinerator disposal) and cost (Evoqua or their subcontractor is likely to be competitive in terms of cost due to use of their established system for removal and transportation of spent carbon).

One caution here is that the process of removal of carbon from the two units still in place near the acrylonitrile tank may generate significant acrylonitrile vapors, and details of that removal process should be obtained before approval is granted.

2.2. Option 2: Management by Landfill Disposal

In the event that the above-referenced management of spent carbon through supplier Evoqua is not chosen, the next most desirable option for removal and disposal of the acrylonitrile-contaminated carbon is through landfill disposal. This method is desirable because it limits handling of carbon on the ATI project site (and therefore potential exposures to the general public or site workers), and limits costs through cheaper transportation and disposal costs). This method will not be available if it is determined that spent carbon will be an EPA hazardous waste (carry any EPA waste codes) due to ignitability (D001), reactivity (D003), or the presence of acrylonitrile (U009). A summary of this management method is shown below:

- a) Wearing Level B personal protective equipment, disconnect carbon unit from associated piping and install blind flanges or caps on all inlet/outlet piping;
- b) Using a long-reach telescoping forklift, rig and lift carbon units and place in a roll-off bin for temporary storage, transportation and disposal;
- c) Transport spent carbon vessels for landfill disposal at Chemical Waste Management's Arlington, Oregon facility, along with associated debris such as personal protective equipment.

2.3. Option 3: Management by Incineration

In the event that Options 1 and 2 are both unavailable, Option 3 consists of transferring spent carbon out of existing vessels into UN-rated containers for transportation to a chemical waste incinerator. To minimize acrylonitrile exposure, this activity is proposed to be conducted at the Chemical Waste Management facility in Arlington, Oregon. The initial stages of this optional management method are similar to Option 2.

- a) Wearing Level B personal protective equipment, disconnect carbon unit from associated piping and install blind flanges or caps on all inlet/outlet piping;
- b) Using a long-reach telescoping forklift, rig and lift carbon units and place in a roll-off bin for temporary storage, transportation and disposal;
- c) Transport spent carbon vessels on a hazardous waste manifest to Chemical Waste Management's Arlington, Oregon facility (CWM);
- d) At the CWM facility, a work area will be constructed using plastic sheeting to contain spills;
- e) Spent carbon will be vacuumed out of carbon vessels using a drum vacuum by a crew wearing Level B personal protective equipment;
- f) The manifest will be changed to reflect that the waste materials are now being transported in drums, and drums will be transshipped for incineration at an approved facility.

3. Graft Reactor Cleaning:

Solidified material in the Graft reactor will be removed by a confined space entry tank cleaning crew in Level B personal protective equipment. The proposed cleaning protocols are presented in brief below:

- a) Transfer standing surface water out of the containment area under the Graft reactor to adjacent containment;
- b) Set up entry, retrieval and ventilation equipment at the top opening of the Graft reactor;
- c) Enter the tank in Level B PPE to manually scrape, shovel or chip residual polymer material from interior surfaces, removing the material using buckets and placing in drums for temporary storage and profiling;
- d) If necessary, use chipping guns, needle scalers or other mechanical means to loosen and remove hardened residue;
- e) After completion of manual removal of residue, pressure wash interior reactor surfaces, removing rinse water with a drum vacuum;
- f) Check acrylonitrile levels in the reactor at the completion of cleaning activities, re-cleaning as needed to reduce acrylonitrile vapors below 2 ppm in interior areas of the reactor.

4. Acrylonitrile Tank Re-Cleaning:

Since residual acrylonitrile vapor was detected in the acrylonitrile tank headspace, additional cleaning will be necessary. The proposed cleaning protocol is presented below:

- a) Set up entry, retrieval and ventilation equipment at the top opening of the Acrylonitrile reactor;
- b) Clean all tank penetrations from the top of the tank using high-pressure line-mole equipment to rinse piping;
- c) Enter the tank in Level B PPE (if necessary) to complete the cleaning of piping;
- d) Remove rinse water with a vacuum truck or drum vacuum, placing wastes in drums for temporary storage and profiling;
- e) Check acrylonitrile levels in the tank at the completion of cleaning activities, re-cleaning as needed to reduce acrylonitrile vapors below 2 ppm in interior areas of the reactor.

5. Acrylonitrile Pump Removal and Disposal:

Four small acrylonitrile pumps are in place in pump cabinets on or near the acrylonitrile tank. Surveying of these pumps for acrylonitrile indicated that some acrylonitrile vapor was present in the vicinity of these pumps. Dismantling and disposal of these pumps is indicated to remove this potential hazard to other site personnel. These four pumps will be disconnected and dismounted from their current placement and placed in a roll-off bin for proposed transport as non-RCRA regulated waste.

6. Ceric Ammonium Nitrate Tank System Cleaning:

Two small poly aboveground storage tanks are present in a cabinet near the acrylonitrile tank. The tanks are empty but are still connected to piping and pumps that connect to the Graft reactor. In the event that there is residual material in these small PVC lines, NRC proposes to remove the piping and pumps, wash the interior surfaces of the two small tanks, and remove standing water in the sub-surface pipe chase that leads from the tanks to the Graft reactor.

- a) Disconnect and remove PVC piping and associated pumps, draining pumps to drums or other containers and placing piping and equipment in a roll-off bin for later transportation and disposal;
- b) Remove standing water from pipe chase(s) with a drum vacuum;
- c) Wash walls and floor of pipe chase with high-pressure washer, collecting wash water with a drum vacuum;
- d) Wash interior of small tanks, collecting wash water in a basin below the tanks and transferring to drums for proposed transport as non-RCRA regulated waste.;

7. Waste Transportation and Disposal:

Waste materials determined to be non-RCRA regulated hazardous wastes will be profiled into a Subtitle D landfill such as Waste Management's Hillsboro Landfill. These materials will then be placed in lined roll-off bins and transported for disposal. NRC anticipates that materials which will likely be suitable for Subtitle D landfill disposal include the ceric ammonium nitrate piping and pumps, the acrylonitrile pumps, the co-polymer piping and the starch starch slurry piping.

This work plan assumes that the remaining wastes on site, including wash water from tank, reactor and pipe chase cleaning will be sampled, profiled and disposed of by others (presumably WasteXpress Environmental Services).

8. Health and Safety:

8.1. Air Monitoring:

NRC personnel will provide their own air monitoring equipment suitable for measuring acrylonitrile or other volatile organic compounds in ambient (breathing zone) air. Monitoring will be performed using a photoionization detector (PID) with 11.7 eV lamp. In the event that levels above 2 ppm are detected with the PID, additional readings will be made with acrylonitrile-specific colorimetric indicator tubes to allow the correct choice of PPE. Action levels for detected levels of acrylonitrile are listed in the table below.

8.2. Action Levels:

AIR MONITORING ACTION LEVELS		
Instrument: Colorimetric Indicator Tubes or PID	Reading	Action
Monitor ambient air in breathing zone of personnel engaged in tank/reactor entry and cleaning, or disassembly or cutting of various pump/piping systems	<2 PPM AN	• Safe for Level D PPE
	2-20 PPM AN	• Upgrade to Level C PPE
	>20 PPM AN	• Upgrade to Level B PPE

8.3. Personal Protective Equipment

Personal protective equipment listed in the above table of Action Levels is defined below.

- Modified Level D or Level C Personal Protective Equipment (PPE) is proposed as the minimum for use in the above-referenced activities, and includes the following at a minimum:
 - Hard hat
 - Saranex-coated Tyvek Coveralls
 - Inner Nitrile gloves
 - Outer PVC or butyl rubber gloves
 - PVC steel-toed boots
 - Face shield or optional full-face air-purifying respirator with organic vapor/acid-gas cartridges.
- Level C PPE consists of the above Level D PPE with the addition of a full-face air-purifying respirator with organic vapor/acid-gas cartridges.
- Level B PPE consists of the above Level D PPE with the addition of a supplied-air respiratory (SCBA or air-line) and substituting TyChem coveralls for the above-referenced Saranex-coated Tyvek coveralls.
- Additional PPE proposed for occasional use during site activities includes fall protection equipment (harness and lanyard) when working above 6 feet in height, and ear plugs when ambient noise is above 85 dB.

I appreciate the opportunity to provide you with this draft Final Hazardous Materials Removal and Abatement Work Plan. If you have any questions regarding this document, you can reach me via e-mail at rransdell@nrcc.com, or by cell phone at 503-209-2209.

Sincerely,

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